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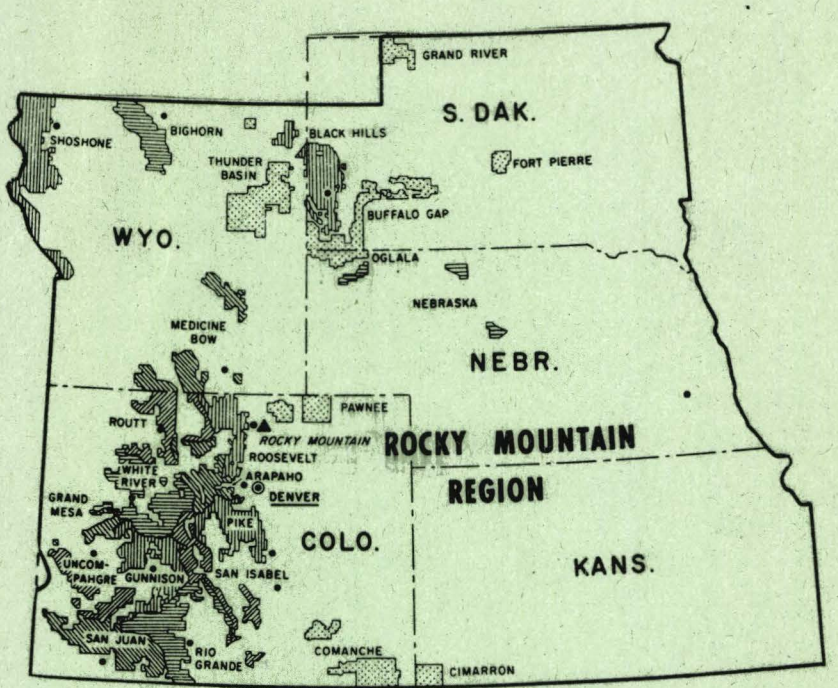
POST CONTROL EVALUATION

ESTES PARK, COLORADO



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POST CONTROL EVALUATION

ESTES PARK, COLORADO

SEPTEMBER, 1974

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INTRODUCTION

On August 8, 9, 14 and 15, Bob Averill, Entomologist, State and Private Forestry, Forest Pest Management, U.S.F.S., Lakewood, Colorado, and Dave Leatherman, Entomologist, Colorado State Forest Service, Foothills Campus, Fort Collins, Colorado, conducted a post control evaluation of the mountain pine beetle (MPB) (Dendroctonus ponderosae, Hopk.) control project in the Estes Park, Colorado area. The purpose of the evaluation was to determine the degree of success of the chemical control operations and to develop recommendations for the coming year which would enhance the management of MPB in the Estes Park area.

Overall, this years project in the Estes Park area greatly exceeded the suppression efforts of projects conducted prior to the creation of the "Designated Control Area" (DCA) approach. Deficiencies or problems were identified and recommendations for corrections developed for future projects.

BACKGROUND

The MPB population in the Estes Park area has been in an increasing trend status since 1969. In August 1972, the Estes Valley Improvement Association (EVIA), composed of area private landowners, was established to deal with the MPB problem. In general, the Association is responsible for contacting landowners, arranging for tree cutting and removal, billing, maintaining records and other administrative duties and some tree marking. The Colorado State Forest Service (CSFS) has worked closely with the EVIA in providing reconnaissance, initial detection and marking of infested trees, chemical treatment of felled trees, biological and socio-economic evaluations. Within the control area Federal lands are administered by the National Park Service, Bureau of Land Management, Bureau of Reclamation and the U. S. Forest Service. In 1973 over 2,500 and in 1974, over 3,000 infested trees were treated by State and Federal agencies working in

the Estes Park control area. Both the CSFS and USFS have taken the initiative in promoting stand management as a means of long term control to lower MPB populations. Several private landowners are beginning to show an interest in stand management techniques. In this DCA, the USFS used Lindane and the CSFS used ethylene dibromide for chemical treatment.

METHODS

Two surveys were conducted to determine the status of the control program. The first survey, a 100% survey within the EVIA control boundaries, was conducted by the CSFS treatment crew following the end of the treating season, to determine by zone (see map) the number of treated and untreated trees. A determination was made as to why trees were not treated (see appendix 1).

The second survey was designed to sample 10% of all treated trees and to determine the success of treatment within randomly selected tree groups (appendix 2). Treated groups ranged in size from one to over 100 trees. This survey also indicated what problems existed and the degree of success of the control operation within treatment groups. In the treated groups selected for sampling, 20% of the felled logs were sampled. In untreated groups, 20% of the infested stems were selected for sampling. Each log or stem selected was sampled by removing two 6 x 6 inch bark squares from opposing sides of the tree. On felled logs, the samples were randomly selected along the length of the bole. If no MPB evidence was found in a log, the most probable reason for felling and treating was determined by examining the full tree. On standing trees, the samples were removed from the 4-1/2' level. The following data were recorded: Number of larvae, pupae and adults, both dead and live, and the number of emergence holes.

Cases of improper marking were segregated into four categories:

1. Ips sp.
2. Dendroctonus valens (LeConte)
3. Strip attack/pitchout
4. Unknown or debatable cause

Also recorded were the number of infested trees missed within two chains from an infested group. Data were separated according to the chemical utilized.

RESULTS

Survey I - A total of 3,441 trees were treated (CSFS - 2,336, RMNP - 180, USFS - 625 and an estimated 300 by private individuals). Six hundred and forty-one infested trees were not treated (16%). The majority of the nontreated trees were never marked or could not be relocated after marking for treatment. Only one percent of the nontreated trees were on lands owned by private parties not wanting chemical treatment. Many of the untreated trees were near the control boundaries indicating a divergence of opinion as to:

1. whether they should be treated, due to rough terrain.
2. misinterpretation of the control boundary on the ground.
3. reluctance to treat infested trees lying on boundaries between Federal and private land holdings.

For the second survey, treatment success within groups, 16 different spot infestations comprised of 257 trees were sampled. Twenty-eight (11%) of these trees were marked, but not treated. Twenty-three (9%) infested trees were missed. Thus, 80% of the infested sample trees were treated.

Misidentified treated trees constituted 3% Ips and 0.5% in each of the other three categories (D. valens, strip attack/pitchout, and unknown). The mean brood counts under 6 x 6 inch bark samples are presented in Table 1. The large standard deviations associated with the treatment reflects the variability in the density of insects along the length of the treated bole as well as the variability in treatment success. Analysis of variance indicates no significant differences between the two chemicals employed. Utilizing the "not treated" as a check, it is readily apparent, and, analysis of variance so indicates, that chemical treatment significantly lowered the density of live MPB in the treated logs.

TABLE 1

	SAMPLE SIZE	DEAD	LIVE	EMERGENCE HOLES
Treated, EDB	80	9.1 ± 37.2	0.4 ± 3.2	.5 ± 2.8
Treated, Lindane	24	6.2 ± 20.7	0	.8 ± 2.4
Not Treated	14	1.4 ± 2.6	0.9 ± 2.6	3.9 ± 7.1

Table 1. Mean Population and Emergence Holes of MPB per 6x6 in. Bark Sample.

A random sample of 13 Lindane treated MPB infested bolts, 18" in length, were brought to Lakewood and placed in a large emergence cage. Seventeen MPB adults emerged from this sample with an average 1.0 + 1.5 emergence holes per 6 x 6 inch bark sample. Only one beetle was alive when the bolts were examined on September 17.

Discussions with a CSFS treating crew indicated that in some areas treated, poor results were being obtained with EDB. The method of mixing the spray solution, as explained by the crew, indicated that possible mixing problems existed. Analysis of the mixed solution in their spray tanks at that time indicated .31 lbs./gal. active ingredient (a.i.). The registered level of a.i. is .4 lb./gal. in the diluted spray. Lindane spray solutions were not analyzed.

DISCUSSION

On the whole, reduction of the MPB population is moving forward as evidenced by the low number of emergence holes (EDB .5 + 2.8, Lindane .8 + 2.4) per 6 x 6 inch bark sample. What this reduction means to the Estes Park area is uncertain at this time since one of the conditions for high populations (high stand density) is still prevalent in some areas. The large standard deviation associated with emergence holes, in the treated trees is probably associated with the few areas where little mortality was associated with the treatment. Possible reasons for lack of mortality in these groups include: failure to limb trees so that they could be rolled and treated on all sides; improper application; and improper mix of chemical solutions.

While the percentage of improper tree selection is low, it is nevertheless a real problem. This would be especially true if a tree selected for removal happened to be a homeowners prized shade or ornamental tree. Correct identification of MPB infested trees, where in doubt, should be based on the presence of the insect, not only on the symptoms, i.e., pitch tubes, blue stain, frass or fading foliage.

Infested trees within a treated group which were not marked for treatment constitute another source of error associated with failure to check an area adequately. Though it is difficult to mark all infested trees in the fall/winter survey due to lack of fading and "blind hits" (trees that show no visible pitch tubes or little frass), it is likely that efficiency can be increased through better training of spotting crews. Also, some groups within the control boundaries

were not treated because the owners did not want chemical treatment or the treating crew determined that the trees were inaccessible. It should be noted that no clear concept of what constitutes an inaccessible area within the control area exists.

It was evident in talking with public and private landowners that more people are becoming interested in stand management as a long term means of minimizing MPB outbreaks in the Estes Park area. Since we are dealing with a natural phenomenon in an ecosystem, an ecosystem which has become high-valued for its esthetics, we are faced with finding a mix of management solutions which will satisfy the majority of interested parties at the least cost in terms of money and risk. Ideally, a program should be developed which will remove trees which exhibit high risk to insect attack and includes thinning of dense intermediate sized stands in a regulated manner.

RECOMMENDATIONS

1. The EVIA provides the logical unit to develop a land use management committee or forestry cooperative for the Estes Valley area. Federal, State and private landowners who have interests in this area should meet on a regular basis to mesh their respective philosophies into a realistic long term management approach to the MPB problem. The future benefits from such a team approach, utilizing the MPB as the beginning toward land management, are unlimited.

2. That a more efficient metering system be utilized to mix the chemical solutions for application and that this be done only by well trained personnel and with proper supervision.

3. That marking crews receive additional training in selecting MPB infested trees so that selection of infested trees is based on the presence of the insect. This should include follow-up ground checks by entomologists from CSFS and R-2 Pest Management. The possibility of utilizing joint training sessions between CSFS and USFS entomologists should be explored.

4. That closer supervision of the treatment operation through periodic mortality checks, as well as chemical analysis of spray samples throughout the treatment season, be utilized to insure that the best job possible is done. This should be done jointly by CSFS and USFS entomologists. This approach would enhance post control evaluation by making it more timely so that any necessary changes could be accomplished more rapidly.

5. That more realistic control boundaries be drawn and that they be fully explained to all involved parties to minimize misunderstandings and false hopes.

6. That agreement be reached as to what trees will be treated and by whom among the various agencies involved.

7. That an adequate recording system be devised so that where and when treatment has taken place can be readily determined.

8. That MPB crews working in the Estes Park area have a better understanding of the total control effort, its management implications as well as economic costs by the various ownership groups so that they may serve as a better source of information and education. And, that these crews' feedback from the public be sought to improve our understanding of this pest in a high use area.

Many of the recommendations listed above are well on their way toward implementation. As problems were encountered, the "lessons learned" were quickly taken to heart to insure that future control efforts will be even more effective.

OFFICE MEMO

TO: Districts DATE: July 29, 1974

FROM: Dave Leatherman

SUBJECT: EXPLANATION SHEET

1. Number of trees treated this season - Only include the total for this DCA.

2. Number of faders untreated (by reason)- For our purposes, a fader is any untreated tree, either fading or completely red, that was attacked in the fall of 1973 and produced beetles in the summer of 1974. You may find a few trees that produced beetles this summer that have not changed color yet. If you do locate these, include them. Be sure there is evidence of emergence so as to distinguish these from fresh hits. What we want is how many trees in the DCA produced beetles this summer that we didn't get.

   Reasons

   a. Marked but not felled - Trees that were marked but HA or its contractors were unable to cut them, lack of time being the main reason (compare with c)

   b. Faders never marked - Trees that the marking crews missed and were never dealt with by treating crews.

   c. Landowner non-cooperative - Regardless of CSFS and HA efforts, landowner either could not be reached, or refused to go along with our program.

   d. Federal ownership - Trees within the DCA or its agreed upon buffer strip that were not treated by USFS, BLM, Bureau of Reclamation or other U.S. government agency. Put number of trees in first blank, agency name in second.

   e. Inaccessible - For reasons such as steep slopes, lack of roads and so on, trees were considered out of reach.

   f. Other

   g. Total - Sum of the tree numbers in a. thru f.

3. For large DCA's complete one form for the several zones or work areas and summarize them onto one total sheet.

POST TREATMENT EVALUATION

DISTRICT_____ DATE_____

DCA NAME_____

1. Number of trees treated this season_____

2. Number of faders untreated (by reason)

   a. Marked but not felled _____

   b. Faders never marked_____

   c. Landowner non-cooperative_____

   d. Federal ownership_____ Agency_____

      _____ Agency_____

   e. Inaccessible_____

   f. Other_____

   g. Total

3. Attach map showing DCA boundary and location of non-treated faders, coded to indicate reasons a. thru f. For fader group, plot center and indicate number in the group. (Example of coding scheme: red map dots for landowner non-cooperatives, green for inaccessibles, etc.)

Appendix 1. CSFS Post Treatment Evaluation Form.

POST CONTROL EVALUATION

T _____ R _____ S _____ Ownership

Treated

No. logs _____ No. trees _____ No. trees missed _____

No. Ips _____ No. D. valens _____ Successful treatment _____

No. Strip./pitch outs _____ No. debatable _____ Unsuccessful treatment _____

6 X 6 Sample

		DEAD			ALIVE			emergence
		larvae	pupa	adult	larvae	pupa	adult	holes
Log 1	a							
	b							
2	a							
	b							
3	a							
	b							
4	a							
	b							
5	a							
	b							
6	a							
	b							
7	a							
	b							
8	a							
	b							
9	a							
	b							
10	a							
	b							
11	a							
	b							
12	a							
	b							
13	a							
	b							
14	a							
	b							
15	a							
	b							
16	a							
	b							
17	a							
	b							
18	a							
	b							
19	a							
	b							
20	a							
	b							

Comments:

Appendix 2. Sample form for evaluating treatment success within infested tree groups.